13/9/8 (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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004748737
WPI Acc No: 1986-252078/198638
XRPX Acc No: N86-188372

Pneumatic tyre **condition monitoring system - has transponder to reflect back** harmonic **of transmitted** RF **signal as function of state of pressure switch**

Patent Assignee: EATON CORP (EAYT)
Inventor: UZZO A P
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 4609905	A	19860902	US 84609411	A	19840511	198638	B

Priority Applications (No Type Date): US 84609411 A 19840511
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 4609905	A		10		

Abstract (Basic): US 4609905 A

A transmitter operates to generate an **RF** signal having a characteristic frequency f. A wheel-mounted passive transponder includes an antenna for receiving the **RF** signal and a nonlinear element in circuit with the antenna. The element effects a distortion of the **RF** siqnal characterised by a **harmonic** signal of a frequency nf, where n is a real integer other than unity. A further antenna in circuit with the non-linear element radiates the **harmonic** signal.

A **tyre** fluid pressure sensor operates to disable generation of the **harmonic** signal in response to variation in a monitored **tyre** condition. A receiver provides a sensible condition signal in response to the **harmonic** signal. The two antennae are distributed about the outer periphery of the associated wheel.

ADVANTAGE - Has operation independent of wheel rotational orientation. (10pp Dwq.No.1/7

Title Terms: PNEUMATIC; **TYRE** ; CONDITION; MONITOR; SYSTEM; TRANSPONDER; REFLECT; BACK; **HARMONIC** ; TRANSMIT; **RF** ; SIGNAL; FUNCTION; STATE; PRESSURE; SWITCH
Derwent Class: Q11; X22
International Patent Class (Additional): B60C-023/00
File Segment: EPI; EngPI
Manual Codes (EPI/S-X): X22-E02

13/9/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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013974638 **Image available**
WPI Acc No: 2001-458851/200150
XRPX Acc No: N01-340177
Tire **tread wear monitoring system for motor vehicles, calculates resonance frequency of** tire **and compares with stored resonance frequency of new** tire **so that wear is determined based on** frequency shift
Patent Assignee: TRW INC (THOP)
Inventor: DUNBRIDGE B; EBERHARD C A; MAGIAWALA K R; MCIVER G W; ZIMMERMAN T A
Number of Countries: 031 Number of Patents: 011
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 1106397	A2	20010613	EP 2000125323	A	20001129	200150	B
CA 2325139	A1	20010603	CA 2325139	A	20001106	200150	
US 6278361	B1	20010821	US 99454443	A	19991203	200150	
JP 2001215175	A	20010810	JP 2000357107	A	20001124	200154	
KR 2001061950	A	20010707	KR 200070305	A	20001124	200175	
TW 499372	A	20020821	TW 2000122258	A	20001023	200333	
KR 384615	B	20030522	KR 200070305	A	20001124	200359	
JP 2004101540	A	20040402	JP 2000357107	A	20001124	200424	
			JP 2003409009	A	20031208		
JP 3516917	B2	20040405	JP 2000357107	A	20001124	200424	
JP 2004151114	A	20040527	JP 2000357107	A	20001124	200441	
			JP 2003409007	A	20031208		
JP 2004184422	A	20040702	JP 2000357107	A	20001124	200443	
			JP 2003409006	A	20031208		

Priority Applications (No Type Date): US 99454443 A 19991203
Abstract (Basic): EP 1106397 A2

NOVELTY - Microprocessor (14) computes discrete **Fourier** transform (**DFT**) of acceleration signals output by radial and lateral accelerometers (2,4), to determine the resonance frequency of acceleration of **tire** . Determined frequency is compared with stored resonance frequency of acceleration of new **tire** , to determine **tire** tread wear based on the **frequency shift** and transmit a signal to driver information display (26).

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) Method of monitoring **tire** tread wear;
(b) Shock absorber performance monitoring system;
(c) Method of monitoring shock absorber performance;
(d) System for monitoring balance condition of vehicle **tire** ;
(e) Method for monitoring balance condition of vehicle **tire** ;
(f) Rotational speed monitoring system;
(g) Method for monitoring rotational speed of vehicle wheel

USE - For monitoring wear of tread of **tire** that affects antilock braking systems and integrated vehicle controllers in motor vehicles such as cars.

ADVANTAGE - Handling performance of motor vehicle is improved by monitoring the **tire** tread wear which alerts the driver about abnormal **tire** wear, thereby reduces the running cost of vehicles.

DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of the monitoring system for vehicle **tire** tread wear.

Radial accelerometer (2)
Microprocessor (14)
Information display (26)

13/9/11 (Item 2 from file: 347)
DIALOG(R)File 347:JAPIO
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06987600 **Image available**
SYSTEM AND METHOD FOR MONITORING VEHICLE STATE EXERTING EFFECT ON **TIRE**

PUB. NO.: 2001-215175 [JP 2001215175 A]
PUBLISHED: August 10, 2001 (20010810)
INVENTOR(s): MAGIAWALA KIRAN R
EBERHARD CAROL A
MCIVER GEORGE W
DUNBRIDGE BARRY
ZIMMERMAN THOMAS A
APPLICANT(s): TRW INC
APPL. NO.: 2000-357107 [JP 2000357107]
FILED: November 24, 2000 (20001124)
PRIORITY: 99 454443 [US 99454443], US (United States of America), December 03, 1999 (19991203)
INTL CLASS: G01M-017/02; B60C-019/00; B60C-023/02; B60C-023/20

ABSTRACT

PROBLEM TO BE SOLVED: To monitor the abrasion, cushioning capacity and balance state of the ground surface of a **tire** and the rotational speed of a wheel.

SOLUTION: A processor 8 performs the fast **Fourier** transform of accelerations in the radial direction and horizontal direction of a **tire** on the basis of the acceleration of the radial direction and horizontal direction of the **tire** detected by sensors 2, 4, in order to monitor the abrasion of the ground surface of the **tire** to determine resonance frequency in a range of 30-60 Hz. The determined resonance frequency is compared with reference resonance frequency showing that there is no abrasion at all and, when there is frequency displacement, it is determined that there is abrasion. Cushioning capacity is in a 0.5-2.0 Hz range and the balance state of the **tire** is in a 5-14 Hz range and the rotational speed of a wheel is in a 0-25 Hz range and **frequency shift** is detected. When there is predetermined shift or more, a transmission circuit 16 transmits a warning signal to a vehicle to display the same on a display.

13/9/14 (Item 5 from file: 347)
DIALOG(R)File 347:JAPIO
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04670168 **Image available**
ULTRASONIC MEASURING APPARATUS FOR VEHICLE-MOUNTING

PUB. NO.: 06-342068 [JP 6342068 A]
PUBLISHED: December 13, 1994 (19941213)
INVENTOR(s): SATO KAZUO
SAKAMOTO MITSUHIRO
KUZUTANI KEIJI
NAKAHARA NAOJI
AOKI YASUYUKI
APPLICANT(s): AISIN SEIKI CO LTD [000001] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 05-131745 [JP 93131745]
FILED: June 02, 1993 (19930602)
INTL CLASS: [5] G01S-015/50; B60G-017/00; G01S-007/52
JAPIO CLASS: 44.9 (COMMUNICATION -- Other); 26.2 (TRANSPORTATION -- Motor Vehicles); 37.2 (SAFETY -- Traffic)
JAPIO KEYWORD: R007 (ULTRASONIC WAVES); R131 (INFORMATION PROCESSING -- Microcomputers & Microprocessers)

ABSTRACT

PURPOSE: To detect the speed of a vehicle with good accuracy by a method wherein ultrasonic waves are sent to a wheel at a prescribed depression inclination, their reflected waves are received and the rotational speed of the wheel is operated on the basis of a **Doppler** frequency.

CONSTITUTION: An ultrisonic-wave transmitter-receiver TR is mounted inside the wheel house of a vehicle 100 in such a way that it is in parallel by D (m) in a direction opposite to the advance direction of the vehicle 100 and that its angle of depression .phi. is set at 45 deg. with reference to its horizontal plane. Then, the wave transmitter-receiver TR transmits ultrasonic oscillations at 200kHz to a tread part T on a **tire** T in a prescribed beam width, and it receives their reflected waves. A wheel-speed operation means operates the rotational speed (sub 0). of a wheel on the basis of the **Doppler frequency** of the **wave** transmitter-receiver TR. Then, the speed operation means operates a vehicle speed V on the basis of the rotational speed of the wheel. When the vehicle speed V is V./(1-(k)) when a **tire** slip rate is designated as (k). Since the slip rate can be approximated to (k) =0 in cases other than 4 braking operation, V 'g 0.. In addition, when the vehicle speed V is integrated and differentiated, a distance and an acceleration can be obtained.

13/9/18 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC
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02177355 INSPEC Abstract Number: A78033969
Title: A technique for measuring the sound of a moving tire
Author(s): Chung, J.Y.; Wilken, I.D.
Author Affiliation: Fluid Dynamics Res. Dept., General Motors Tech. Center, Warren, MI, USA
Journal: Journal of Sound and Vibration vol.55, no.1 p.9-18
Publication Date: 8 Nov. 1977 Country of Publication: UK
CODEN: JSVIAG ISSN: 0022-460X
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: A measurement and analysis technique has been developed to determine the narrow band spectra and the radiation patterns of the sound emitted by a moving **tire** . The sound is measured by a semicircular array of stationary microphones as the **tire** passes by the array and is recorded on a multi-channel tape recorder. In the analysis procedure corrections are made for effects associated with a moving sound source, such as the non-stationarity of the signal due to the time-dependent transmission path and the **Doppler frequency shifts**. In this way the power spectra and the radiation pattern of the sound signal are determined as if the receiver were moving with the **tire** at a fixed distance. A relationship between the **Doppler** effect and the frequency resolution associated with the finite **Fourier** transform is presented. This relation is used as a basis for the **Doppler** correction procedure. (4 Refs)
Subfile: A
Descriptors: acoustic noise; acoustic variables measurement; road traffic
Identifiers: narrow band spectra; radiation patterns; semicircular array; stationary microphones; **Doppler** effect; finite **Fourier** transform; **tyre** noise; measurement technique
Class Codes: A4350 (Noise, its effects and control); A4385 (Acoustical measurements and instrumentation)

18/9/19
DIALOG(R)File 2:INSPEC
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04264312 INSPEC Abstract Number: C89004966
Title: The use of X-radiography and computer software for detecting defects **during the manufacture of steel-belt** tyres
Author(s): Gayer, A.; Saya, A.
Author Affiliation: Soreq Nucl. Res. Center, Yavne, Israel
Journal: NDT International vol.21, no.5 p.333-6
Publication Date: Oct. 1988 Country of Publication: UK
CODEN: NDITDS ISSN: 0308-9126
U.S. Copyright Clearance Center Code: 0308-9126/88/050333-04$3.00
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P)
Abstract: Describes an algorithm which can be incorporated into a real-time X-ray system to **detect defects characteristic** of steel belt **tyres** . The algorithm is based on the **Fourier** transform, which permits, by power spectrum **analysis** , the **detection** of **deviations** in the steel cord pattern from the normal structure. The algorithm can be used as a real-time method during the preliminary stage of rubber sheet production, or for **inspection** of the final product. (4 Refs)
Subfile: C
Descriptors: **flaw detection** ; mechanical engineering computing; radiography; rubber; spectral **analysis**
Identifiers: X-radiography; computer software; **defects** ; real-time X-ray system; steel belt **tyres** ; **Fourier** transform; power spectrum **analysis** ; steel cord pattern; rubber sheet production
Class Codes: C7440 (Civil and mechanical engineering)
? t s22/9/8,11,21

13/9/21 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
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06209036 E.I. No: EIP02477222031
Title: Continuous-scan vibration measurements on moving components
Author: Stanbridge, A.B.; Martarelli, M.; Ewins, D.J.
Corporate Source: Imperial College Mechanical Engineering Department, London SW7 2BX, United Kingdom
Conference Title: Proceedings of IMAC-XX: A Conference on Structural Dynamics
Conference Location: Los Angeles, CA, United States Conference Date: 20020204-20020207
E.I. Conference No.: 60222
Source: Proceedings of SPIE - The International Society for Optical Engineering v 4753 II 2002. p 1519-1525
Publication Year: 2002
CODEN: PSISDG ISSN: 0277-786X
Language: English
Document Type: CA; (Conference Article) Treatment: T; (Theoretical)
Journal Announcement: 0211W4
Abstract: The measurement beam of a laser **Doppler** vibrometer (LDV) can be directed so as to scan over the surface of a vibrating structure, to measure its ODS, even if it is, within limits, moving. For example, the out-of-plane vibration of a disc can be recovered, as an ODS, by using a continuous circular LDV scan, centred on the axis. Travelling and standing-wave vibration components are easily separated. Standing-wave distortion in automobile **tires** , due to contact loading, can also be measured in this way, on a 'rolling road'. A vibration ODS may also be derived by using a sinusoidal scan around a restricted arc, which may be useful if the target is partially obscured. Analysis is exactly the same as for a sinusoidal straight-line scan which is, by analogy, therefore applicable to the measurement of standing and travelling wave vibration in belt-drive systems. 3 Refs.
Descriptors: *Vibration measurement; Laser applications; **Tires** ; Belt drives; **Fourier** transforms
Identifiers: Laser **Doppler** vibrometer (LDV)
Classification Codes:
943.2 (Mechanical Variables Measurements); 744.9 (Laser Applications); 818.5 (Rubber Products); 602.1 (Mechanical Drives); 921.3 (Mathematical Transformations)
943 (Mechanical & Miscellaneous Measuring Instruments); 744 (Lasers); 818 (Rubber & Elastomers); 602 (Mechanical Drives & Transmissions); 921 (Applied Mathematics)
94 (INSTRUMENTS & MEASUREMENT); 74 (LIGHT & OPTICAL TECHNOLOGY); 81 (CHEMICAL ENGINEERING, PROCESS INDUSTRIES); 60 (MECHANICAL ENGINEERING, GENERAL); 92 (ENGINEERING MATHEMATICS)

13/9/30 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus
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05279328 JICST ACCESSION NUMBER: 02A0839118 FILE SEGMENT: JICST-E
Wireless Strain Monitoring of Tire **with Electrical Capacitance.**
TODOROKI AKIRA (1); SHIMAMURA YOSHINOBU (1); MIYATANI SHINTARO (2)
(1) Tokyo Inst. of Technol.; (2) Tokyo Inst. of Technology, Graduate School
Nihon Kikai Gakkai Nenji Taikai Koen Ronbunshu, 2002, VOL.2002,NO.Vol.6,
PAGE.209-210, FIG.5, REF.4
JOURNAL NUMBER: X0587BAW
UNIVERSAL DECIMAL CLASSIFICATION: 629.33.05
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Conference Proceeding
ARTICLE TYPE: Short Communication
MEDIA TYPE: Printed Publication
ABSTRACT: Strain monitoring of **tires** of automobiles in-service is quite effective to improve reliability of **tires** and design tools. In the previous study, authors have proposed a new wireless strain monitoring method that adopts a **tire** itself as a sensor with an oscillator circuit. In the present study, a new passive strain measurement system utilize electric capacitance change of steel wire reinforced **tires** is proposed and experimentally investigated. The passive wireless strain monitoring method makes use of the specimen cut from the **tire** as a condenser of a passive filter circuit. Deformation of the **tire** brings capacitance change of the **tire** comprises steel wire and rubber; the change of the capacitance makes the change of filtering **frequency** of **radio wave** . Measurement of the **frequency** of **radio wave** passed through the filter circuit enables us to measure the strain of the **tire** wirelessly. A rectangular specimen cut from a commercially available **tire** is adopted as a specimen. Tension test is performed and the change of filtering capacity is measured during the test. As a result, the method is experimentally proved to be effective for the passive wireless strain monitoring of **tires** . (author abst.)
DESCRIPTORS: **tire** ; strain; monitoring; **radio** transmission; electrostatic capacity; LC oscillator
BROADER DESCRIPTORS: communication system; method; capacity; oscillator(circuit); signal generator
CLASSIFICATION CODE(S): QG03040V

13/9/31 (Item 1 from file: 95)
DIALOG(R)File 95:TEME-Technology & Management
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01568392 20011203086
Joint time-frequency analysis of tracking laser Doppler **vibrometry data on a rolling** tire
(Laser- **Doppler** -Schwingungsmesser fuer rollende Reifen)
Castellini, P; Montanini, R
Univ. di Ancona, I; Univ. di Messina, I
Sensor 2001. 10th Int. Conference. Proceedings, Nuremberg, D, May 8-10, 20012001
Document type: Conference paper Language: English
Record type: Abstract

ABSTRACT:
Zur Messung des zeitlichen Verlaufs der Vibrationsgeschwindigkeit rollender Reifen wird die Anwendung der synchronisierten Laser- **Doppler** -Schwingungsmesstechnik in Kombination mit einer Zeit-Frequenz-Verbund-Analyse (ZFVA) vorgestellt. Mit diesem Verfahren werden die relativen Geschwindigkeiten zwischen dem Laserstrahl und der Reifenoberflaeche beseitigt und damit das optische Rauschen drastisch reduziert. Das Messsystem umfasst ein abtastendes Laser- **Doppler** -Vibrometer, in dem die Spiegel von zwei PID-Reglern gesteuert werden, die von einem Codierer die Steuerungssignale erhalten, der als Rueckkopplungssensor auf dem Rotor angebracht ist. Die Position des Laserstrahls wird von den Positionsaufnehmern auf den Spiegeln angegeben. Die Datenerfassung ist so eingestellt, dass sie immer an der gleichen Winkelposition des Reifens beginnt. Die Winkel werden mit einer Genauigkeit von 0,125 Grad bestimmt. Das Aufloesungsvermoegen ist besser als 1 mm. Auf Grund der Nichtstationaritaet der Messungen ist eine **Fourier** -Transformation zur Datenverarbeitung ungeeignet. Vielmehr wird mit Hilfe der ZFVA die eindimenaionale Zeit- oder Frequenzfunktion in eine zweidimenisonale Funktion der Zeit und der Frequenz ueberfuehrt. Dazu werden als Algorithmen die quadratische Kurzzeit- **Fourier** -Transformation, das Gabor-Spektrogramm, die Wigner-Ville-Verteilung, die Pseudo-Wigner-Ville-Verteilung, die Choi-Williams-Verteilung, die kegelfoermige Verteilung und das adaptive Spektrogramm angewendet, von denen die letzten vier die beste Eignung besitzen. Die auf diese Weise erhaltenen Signale lassen sich in drei Signalgruppen aufteilen. Diese sind die ansteigenden Frequenzlinien vor dem Kontaktbereich, die konstanten Frequenzlinien, die die Vibration des ganzen Reifens praesentieren, und die abfallenden Frequenzlinien, die auf das ploetzliche Zusammenpressen des Spurkranzes zurueckzufuehren sind.

DESCRIPTORS: OSCILLATION MEASUREMENT; **TIRE** --HOOP; OPTICAL MEASURING TECHNIQUE; CONTACTLESS MEASUREMENT; **DOPPLER** EFFECT; NOISE--SOUND; ACOUSTIC NOISE REDUCTION; ACOUSTIC NOISE SUPPRESSION
IDENTIFIERS: Schwingungsmessung; rollender Reifen

5/9/3 (Item 3 from file: 350)
DIALOG(R) File 350:Derwent WPIX
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015972886
WPI Acc No: 2004-130727/200413
XRAM Acc No: C04-052099
XRPX Acc No: N04-104218
Sensor for sensing characteristic(s) of rotating object, i.e. **tire**, has flexible piezoelectric element having access to ground plane and incorporating electrically conductive element(s) to facilitate communication externally
Patent Assignee: EVANS J A (EVAN-I); MASON G L (MASO-I); US SEC OF ARMY
Inventor: EVANS J A; MASON G L
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 20030188579	A1	20031009	US 2002118001	A	20020409	200413	B
US 6739195	B2	20040525	US 2002118001	A	20020409	200435	

Priority Applications (No Type Date): US 2002118001 A 20020409
Abstract (Basic): US 20030188579 A1

NOVELTY - Sensor for sensing at least one characteristic of a rotating object comprises a flexible piezoelectric element having access to a ground plane and incorporating at least one electrically conductive element to facilitate communication externally. The flexible piezoelectric element receives a physical input that is translated to an electrical output. The flexible piezoelectric element circumscribes a circumference of the rotating object.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(a) a system for detecting anomalies in at least one characteristic of a rotating object, which comprises a flexible piezoelectric element (101), at least one transceiver external to the flexible piezoelectric element in operable communication with the flexible piezoelectric element, and at least one processor in operable communication with the transceiver to identify the anomalies in a pre-specified manner; and

(b) a method for sensing pre-specified characteristics of a rotating object, which comprises receiving at a flexible piezoelectric element circumscribing a circumference of the rotating object, where acoustic energy traverses at least a portion of the object; translating at least a portion of the received acoustic energy to a signal represented by an electrical current; and communicating the signal to a device external to the piezoelectric element for subsequent processing, where the processing results in identifying the pre-specified characteristic.

USE - The device is used for sensing at least one characteristic of a rotating object, i.e. a **tire** (claimed).

ADVANTAGE - The invention eliminates the need for separate power source to be mounted on the wheel to effect the operation, i.e. the sensor system is self-powered.

DESCRIPTION OF DRAWING(S) - The figure is a side view of the invention taken of a vertical cut through the **tire**/wheel center.

Flexible piezoelectric element (101)
Rim (106)
Sound wave (110)
Wheel (114)
Tire (115)

TECHNOLOGY FOCUS - INSTRUMENTATION AND TESTING - Preferred Device:

The rotating object is a **tire** (115) having a sidewall portion and a tread portion, and mounted on a wheel (114) to establish a gas-filled cavity within the **tire**. The flexible piezoelectric element circumscribes a circumference of the wheel within the gas-filled cavity. The characteristic is acoustical impedance. The electrically conductive element comprises two electrodes, each incorporating connectors for facilitating external communications. The external element is an amplifier having an electrical impedance of at least approximately 10 mega ohms. The external output of the piezoelectric element is analyzed using a phase determination algorithm which detects a change in acoustical impedance relative to a reference by identifying a shift in the sound wave velocity due to a hot spot. The system further comprises a **tire** speed sensor to measure rotational **tire** speed determined with respect to a pre-determined time referenced characteristic signature of the **tire**. Any Doppler shift which occurs due to **tire** rotation is compensated from the measured **tire** rotation speed and the resultant Doppler shift is sampled once per rotation. The system further comprises a **tire** position sensor to measure angular position of portions of the **tire** that may be experiencing at least one anomaly.

POLYMERS - Preferred Materials: The flexible piezoelectric element comprises a polarized fluoro-polymer, preferably polyvinylidene fluoride.

Preferred Dimension: The polyvinylidene fluoride is approximately 40 microns thick, 2.2 cm wide, and of a length approximating the circumference of the wheel

Title Terms: SENSE; SENSE; CHARACTERISTIC; ROTATING; OBJECT; FLEXIBLE; PIEZOELECTRIC; ELEMENT; ACCESS; GROUND; PLANE; INCORPORATE; ELECTRIC; CONDUCTING; ELEMENT; FACILITATE; COMMUNICATE; EXTERNAL
Derwent Class: A89; S02; S03; V06; X22
International Patent Class (Main): G01N-029/16; G01N-029/18
File Segment: CPI; EPI
Manual Codes (CPI/A-N): A09-A03; A12-E15; A12-L04B
Manual Codes (EPI/S-X): S02-J02A; S03-E08A; S03-E08X; V06-L01A2; X22-X
Polymer Indexing (PS):
<01>
001 2004; R00363 G0555 G0022 D01 D12 D10 D51 D53 D58 D69 D82 F- 7A; H0000
002 2004; Q9999 Q7874; J9999 J2904; K9416; ND01; Q9999 Q9392 Q7330; B9999 B4035 B3930 B3838 B3747; B9999 B5243-R B4740
<02>
001 2004; H0124-R
002 2004; Q9999 Q9256-R Q9212; N9999 N6382-R; J9999 J2915-R; K9416; ND05

22/9/8
DIALOG(R)File 2:INSPEC
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08828498 INSPEC Abstract Number: A2004-04-4340-007, C2004-02-1220-035
Title: Vibrational response prediction of a pneumatic tyre **using an orthotropic two-plate wave model**
Author(s): Muggleton, J.M.; Mace, B.R.; Brennan, M.J.
Author Affiliation: Inst. of Sound & Vibration Res., Southampton Univ., UK
Journal: Journal of Sound and Vibration vol.264, no.4 p.929-50
Publisher: Academic Press,
Publication Date: 17 July 2003 Country of Publication: UK
CODEN: JSVIAG ISSN: 0022-460X
SICI: 0022-460X(20030717)264:4L.929:VRPP;1-D
Material Identity Number: J109-2003-030
U.S. Copyright Clearance Center Code: 0022-460X/03/$30.00
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T); Experimental (X)
Abstract: A wave model to predict the vibrational response of a pneumatic **tyre** subject to line force excitation is presented. The tread and sidewalls are each modelled as thin, flat orthotropic plates with in-plane tension, which are joined together by a translational stiffness, and to a rigid rim. The dynamic response of the **tyre** to **harmonic** excitation is decomposed into spatial **harmonics** around the circumference, and waves in the meridional direction. At low frequencies (<100 Hz), the response is stiffness-like, and is controlled by the sidewall **properties** and tension effects resulting from the **tyre** pressure. In the mid-frequency range (100-500 Hz), a resonant response is observed, associated with modes both across and around the **tyre** . At high frequencies (>500 Hz), the response tends towards that of an infinite orthotropic plate. Experiments have been conducted on an inflated **tyre** fitted to a wheel rim to confirm the theoretical findings. The results show reasonable agreement with the predictions, the model accurately reflecting the phenomenological behaviour. (11 Refs)
Subfile: A C
Descriptors: acoustic wave propagation; dynamic response; elastic waves; **harmonics** ; modelling; plates (structures); resonance; **tyres** ; vibrations; wave equations
Identifiers: vibrational response prediction; pneumatic **tyre** ; orthotropic two-plate wave model; line force excitation; tread **tyre** model ; in-plane tension; translational stiffness; rigid rim; dynamic response; **harmonic** excitation; spatial **harmonics** ; meridional direction; sidewall **tyre** model; **tyre** pressure; resonant response; infinite orthotropic plate ; phenomenological behaviour; sidewall **properties** ; resonance modes; 100 to 500 Hz
Class Codes: A4340 (Structural acoustics and vibration); A4630M (Vibrations, aeroelasticity, hydroelasticity, mechanical waves, and shocks); A4620 (Continuum mechanics); A4320 (General linear acoustics); A6230 (Mechanical and elastic waves); A0340K (Waves and wave propagation: general mathematical aspects); C1220 (Simulation, modelling and identification)
Numerical Indexing: frequency 1.0E+02 to 5.0E+02 Hz

22/9/21
DIALOG(R)File 2:INSPEC
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05004717 INSPEC Abstract Number: C91075164
Title: Analysis of aircraft tires **via semianalytic finite elements**
Author(s): Noor, A.K.; Kim, K.O.; Tanner, J.A.
Author Affiliation: George Washington Univ., NASA Langley Res. Center, Hampton, VA, USA
Journal: Finite Elements in Analysis and Design vol.6, no.3 p. 217-33
Publication Date: March 1990 Country of Publication: Netherlands
CODEN: FEADEU ISSN: 0168-874X
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T)
Abstract: A computational procedure is presented for the geometrically nonlinear analysis of aircraft **tires** . The **tire** was modeled by using a two-dimensional laminated anisotropic shell theory with the effects of variation in material and geometric **parameters** included. The four key elements of the procedure are: (1) semianalytic finite elements in which the shell variables are represented by **Fourier** series in the circumferential direction and piecewise polynomials in the meridional direction; (2) a mixed formulation with the fundamental unknowns consisting of strain **parameters** , **stress** -resultant **parameters** , and generalized displacements; (3) multilevel operator splitting to effect successive simplifications, and to uncouple the equations associated with different **Fourier harmonics** ; and (4) multilevel iterative procedures and reduction techniques to generate the response of the shell. (24 Refs)
Subfile: C
Descriptors: finite element analysis; iterative methods; structural engineering computing
Identifiers: aircraft **tires** ; semianalytic finite elements; two-dimensional laminated anisotropic shell theory; piecewise polynomials; mixed formulation; **stress** -resultant parameters ; generalized displacements; multilevel operator splitting; multilevel iterative procedures; reduction techniques
Class Codes: C7440 (Civil and mechanical engineering)

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DIALOG(R)File 2:INSPEC
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07913809 INSPEC Abstract Number: A2001-11-4630R-002, B2001-06-7320G-012
Title: Vibration measurements on rolling tyres **by Tracking Laser** Doppler **Vibrometer**
Author(s): Castellini, P.; Cupido, E.; Baldoni, F.; Ingenito, G.
Author Affiliation: Dipt. di Meccanica, Ancona Univ., Italy
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.4072 p.169-75
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 2000 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(2000)4072L.169:VMRT;1-I
Material Identity Number: C574-2000-228
U.S. Copyright Clearance Center Code: 0277-786X/2000/$15.00
Conference Title: Fourth International Conference on Vibration Measurements by Laser Techniques: Advances and Applications
Conference Sponsor: SPIE
Conference Date: 21-23 June 2000 Conference Location: Ancona, Italy
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Experimental (X)
Abstract: This paper describes the application of a Tracking Laser **Doppler** Vibrometer to the measurement of side-wall vibration of a **tyre** during its rotation. An optimized version of the TLDV was developed for the specific application. The developed system was therefore applied to a rotating drum bench on an automotive **tyre** . The new version of TLDV is presented and some results on a real automotive **tyre** are shown. (5 Refs)
Subfile: A B
Descriptors: laser velocimetry; vibration measurement
Identifiers: vibration measurements; rolling **tyres** ; tracking laser **Doppler** vibrometer; side-wall vibration; rotating drum bench; automotive **tyre** ; TLDV
Class Codes: A4630R (Mechanical measurement methods and techniques for solids); A0630M (Measurement of mechanical variables); A4262E (Metrological applications of lasers); B7320G (Mechanical variables measurement); B4360E (Metrological applications of lasers)
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DIALOG(R)File 2:INSPEC
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02773265 INSPEC Abstract Number: A82001083
Title: External tire **/road noise: its generation and reduction**
Author(s): Nilsson, N.-A.; Bennerhult, O.; Soderqvist, S.
Author Affiliation: IFM Akustikbyran AB, Stockholm, Sweden
Conference Title: Inter-Noise 80. Noise Control for the 80's. Proceedings of the 1980 International Conference on Noise Control Engineering p. 245-52 vol.1
Editor(s): Maling, G.C., Jr.
Publisher: Noise Control Found, New York, NY, USA
Publication Date: 1980 Country of Publication: USA 2 vol. xxxvi+1194 pp.
ISBN: 0 931784 03 4
Conference Sponsor: Internat. Inst. Noise Control Eng
Conference Date: 8-10 Dec. 1980 Conference Location: Miami, FL, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P); Experimental (X)
Abstract: Outlines an indoor laboratory research program into **tyre** /road noise processes. Laser **doppler** vibrometry was used for contactless measurement of vibrations in rotating structures. (18 Refs)
Subfile: A
Descriptors: acoustic noise; automobiles; noise abatement
Identifiers: laser **doppler** vibrometry; noise abatement; **tire** /road noise; vibrations; rotating structures
Class Codes: A4350 (Noise, its effects and control)

52/9/4 (Item 2 from file: 347)
DIALOG(R)File 347:JAPIO
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07560388
TIRE AND SUSPENSION MONITORING METHOD AND DEVICE THEREOF

PUB. NO.: 2003-054229 [JP 2003054229 A]
PUBLISHED: February 26, 2003 (20030226)
INVENTOR(s): DUNBRIDGE BARRY
BROWN KENNETH L
MCIVER GEORGE W
MAGIAWALA KIRAN R
CHILCOTT KELLEY D
APPLICANT(s): TRW INC
APPL. NO.: 2002-198364 [JP 2002198364]
FILED: July 08, 2002 (20020708)
PRIORITY: 01 900324 [US 2001900324], US (United States of America), July 06, 2001 (20010706)
INTL CLASS: B60C-019/00; B60C-023/02; G01P-015/00; G01P-015/18

ABSTRACT

PROBLEM TO BE SOLVED: To provide a novel **tire** and suspension monitoring method and a device thereof.
SOLUTION: This **tire** and suspension monitoring and alarming device performs monitoring and has one set of multifunction sensors for giving an alarm of a failure mode. The device monitors **tire** imbalance, wear of a **tire** tread, and a shock absorber for a **tire** attached to a vehicle and gives an alarm. The device measures acceleration in the axial direction, radial direction, and longitudinal direction of wheels to provide acceleration signal sample power. Concerning the **tire** imbalance, signal sample power in a secondary high **harmonic** wave of **tire** rotation **frequency** is compared with a primary high harmonic wave. Concerning the wear of the **tire** tread, average signal sample power in a scope of secondary **frequency** is compared with a base line value stored in advance. As for shock absorber performance, the total of all the **frequency** components in a scope of predetermined secondary **frequency** is compared with the base line value.

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06987600
SYSTEM AND METHOD FOR MONITORING VEHICLE STATE EXERTING EFFECT ON **TIRE**

PUB. NO.: 2001-215175 [JP 2001215175 A]
PUBLISHED: August 10, 2001 (20010810)
INVENTOR(s): MAGIAWALA KIRAN R
EBERHARD CAROL A
MCIVER GEORGE W
DUNBRIDGE BARRY
ZIMMERMAN THOMAS A
APPLICANT(s): TRW INC
APPL. NO.: 2000-357107 [JP 2000357107]
FILED: November 24, 2000 (20001124)
PRIORITY: 99 454443 [US 99454443], US (United States of America), December 03, 1999 (19991203)
INTL CLASS: G01M-017/02; B60C-019/00; B60C-023/02; B60C-023/20

ABSTRACT

PROBLEM TO BE SOLVED: To monitor the abrasion, cushioning capacity and balance state of the ground surface of a **tire** and the rotational speed of a wheel.

SOLUTION: A processor 8 performs the fast Fourier transform of accelerations in the radial direction and horizontal direction of a **tire** on the basis of the acceleration of the radial direction and horizontal direction of the **tire** detected by sensors 2, 4, in order to monitor the abrasion of the ground surface of the **tire** to determine resonance **frequency** in a **range** of 30-60 Hz. The determined resonance **frequency** is compared with reference resonance **frequency** showing that there is no abrasion at all and, when there is **frequency** displacement, it is determined that there is abrasion. Cushioning capacity is in a 0.5-2.0 Hz **range** and the balance state of the **tire** is in a 5-14 Hz **range** and the rotational speed of a wheel is in a 0-25 Hz **range** and **frequency shift** is detected. When there is predetermined **shift** or more, a **transmission** circuit 16 **transmits** a warning **signal** to a vehicle to display the same on a display.

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05512132
METHOD AND DEVICE FOR DETECTING AIR PRESSURE OF **TIRE**

PUB. NO.: 09-126932 [JP 9126932 A]
PUBLISHED: May 16, 1997 (19970516)
INVENTOR(s): KAWAI HIROAKI
HATTORI KATSU
APPLICANT(s): AISIN SEIKI CO LTD [000001] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 07-308183 [JP 95308183]
FILED: October 31, 1995 (19951031)
INTL CLASS: [6] G01L-017/00; B60C-023/02
JAPIO CLASS: 46.1 (INSTRUMENTATION -- Measurement); 26.2 (TRANSPORTATION -- Motor Vehicles)
JAPIO KEYWORD: R131 (INFORMATION PROCESSING -- Microcomputers & Microprocessers)

ABSTRACT

PROBLEM TO BE SOLVED: To always accurately detect the air pressure of a **tire**.
SOLUTION: A vibration electrical **signal** containing the vibration **frequency** component of a **tire** TR outputted by a vibration electrical **signal** output means BS is supplied to a wavelet transform means WT. The wavelet transform means WT uses a **fundamental** wavelet function mw which locally exists in terms of time as a base, performs wavelet transform according to a **shift** parameter (b) indicating a time position by the wavelet function which is enlarged or reduced by a scale parameter (a), and operates a wavelet coefficient F (a, b). Then, a resonance **frequency** extraction means VF extracts the resonance **frequency** of the **tire** TR based on the state of a wavelet coefficient F (a, b), thus estimating the air pressure of the **tire** TR based on the resonance **frequency** by an air pressure estimation means PE.